

REMARKS/ARGUMENTS

Reconsideration and withdrawal of the rejections of the application and consideration and entry of this paper are respectfully requested in view of the herein remarks, which place the application in condition for allowance.

I. STATUS OF THE CLAIMS AND FORMAL MATTERS

Claims 1-8, 10, and 15-20 are currently pending. Claims 1-7 were previously withdrawn from this application in a response to a restriction requirement. Claims 9, 11, 12, and 13 were cancelled in previous responses.

Claims 8, 15, and 18 are hereby amended. No new matter has been introduced. Support for this amendment is provided throughout the Specification as originally filed.

II. REJECTIONS UNDER 35 U.S.C. § 103

Claims 8, 10, 15, and 18-20 are rejected under 35 U.S.C. § 103(a) as unpatentable over *Capacitance-Type Alcohol Sensor*, The Society of Automotive Engineers of Japan, Annual Congress Preliminary Printing Collection 936, 1993-10, Previously Presented. 257-260 by Sanma et al. ("Sanma") in view of U.S. Patent No. 5,635,628 to Fleischer et al. ("Fleischer").

Applicant respectfully traverses for at least the following reasons.

Independent claim 8, as amended, recites, *inter alia*:

An alcohol concentration sensor of **an electrostatic capacitance type** adapted to measure an alcohol concentration in an internal combustion engine fuel mixed with alcohol, comprising:

an insulating substrate having a thickness between 200 and 1000 μm ;

a pair of electrodes arranged on a surface of the insulating substrate...

a pair of lead-out electrodes connected respectively to the pair of electrodes; and

a resin mold,

wherein the connection ends of the lead-out electrodes and a part of the insulating substrate are sealed by the resin mold forming a resin-sealed body,

wherein the insulating substrate is made of a material showing a specific dielectric constant of not higher than 5, and each of the pair of electrodes is at least partly covered by an insulating protective film having a thickness between 0.4 and 1 μm ,

wherein the insulating protective film is made of a material showing a specific dielectric constant of not higher than 5, and

wherein the resin mold exposes to the outside at least a part of the surface of the insulation substrate with the electrodes and insulating protective film formed thereon, so that the insulating protective film covers the electrodes, and the insulating protective film is configured to be brought into contact with the internal combustion engine fuel mixed with alcohol.

Page 4 of the Office Action asserts that Sanma teaches, among other things, “an insulating substrate and a pair of electrodes (Center and Outer) arranged on a surface of the insulating substrate,”...”the insulating substrate is made of a material showing a low dielectric constant (i.e., discussion on page 3 and 9 of their [Sanma] translation) in their taught insulating resin mold, substrate” (sic) and “a pair of lead out electrodes (i.e., leading out from the center and outer electrodes) that are exposed by the resin mold and...are capable of being brought into contact with the fuel mixed with alcohol.”

The Office Action concedes that the reference fails to teach a substrate thickness between 200 and 1000 μm , has a dielectric constant not higher than 5, that the pair of electrodes is at least partly covered by an insulated protective film with a dielectric constant not higher than 5 or having a thickness between 0.4 and 1 μm . Instead, the Office Action relies upon Fleischer and the level of ordinary skill for these teachings.

Initially, Applicants submit the Office Action has not clearly indicated the particular components of the reference to which the claim limitations allegedly correspond. For example, the Office Action fails to indicate which components of the reference correspond to the claimed resin mold, substrate, or lead out electrodes.

As recited in M.P.E.P. 2142:

The Supreme Court in *KSR International Co. v. Teleflex Inc.*, 550 U.S. ___, ___, 82 USPQ2d 1385, 1396 (2007) noted that the analysis supporting a rejection under 35 U.S.C. 103 should be made explicit. The Federal Circuit has stated that "rejections on obviousness cannot be sustained with mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness."

Applicants submit the Office Action fails to identify the elements of the reference over which the claimed features are allegedly obvious. Accordingly, the rejections are defective.

Furthermore, the Office Action fails to address the recitation in the claims of **wherein the connection ends of the lead-out electrodes and a part of the insulating substrate are sealed by the resin mold forming a resin-sealed body**. Applicants submit that by failing to address this limitation, the Office Action is incomplete.

In the event that the components have been identified with sufficient specificity, and that the Office Action can be found to be complete, a finding the Applicant submits cannot be reasonably made, Applicants submit the reference fails to disclose or render predictable the claimed invention.

The Office Action asserts that Sanma discloses **an insulating substrate and a pair of electrodes arranged on a surface of the insulating substrate**, identifying the pair of electrodes as the Center and Outer electrodes of Fig. 10 in the reference. However, numbered paragraph 4, on page 9 of the English translation of Sanma, recites, "The electrode unit has a

coaxial cylindrical structure.” Applicant asserts that one of ordinary skill in the art would not consider a coaxial electrode unit to be **a pair of electrodes** as recited in the claims.

The reference is silent on the electrodes **arranged on a surface of the insulating substrate** as required. Even if the electrode can be found to be arranged on a surface of the insulating substrate, which Applicant submits cannot be found, as a “coaxial unit,” only the outer electrode would be actually **arranged on a surface of the insulating substrate**.

Accordingly, the reference does not disclose or render predictable **an insulating substrate and a pair of electrodes arranged on a surface of the insulating substrate** as required by the claims.

The Office Action asserts the insulating substrate is made of a material showing a low dielectric constant, citing to a discussion found on pages 3 and 9 of the translation of Sanma provided by the Examiner. Applicants submit no such teaching can be found in the cited pages.

Contrary to the assertion in the Office Action, page 3 of Sanma is directed to the dielectric constant of the fuel, not of the substrate. The carryover line from page 2 to page 3 of the translated reference recites, “gasoline is less likely to polarize, and therefore its relative dielectric constant is small or 2.” Numbered paragraph 2.2 recites, “[the] dielectric constant that is the detecting object are a key factor.” Further, “Fig. 1 shows the frequency characteristics of relative dielectric constant.” Applicant submits the title of Fig. 1 of Sanma is “Frequency characteristic of dielectric constant by methanol content.” Clearly, the references to dielectric constant found on page 3 is to the dielectric constant of the fuel.

Applicants submit that page 9 of the Sanma translation is directed to circuitry provided to prevent corrosion of the electrode unit and the general structure of the sensor. The cited portion

of the reference therefore fails to discuss the dielectric constant of the sensor or any component of the sensor.

Without specificity, the Office Action asserts on page 4 that the Sanma reference teaches “a pair of lead out electrodes (i.e., leading out from the center and outer electrodes) that are exposed to by the resin mold and...capable of being brought into contact with the fuel,” citing to Fig. 10 of the reference. However, no lead out electrodes are shown in the figure, nor is there any disclosure in the specification suggesting lead out electrodes connected to the pair of electrodes.

Applicants submit that Sanma fails to teach **a pair of lead-out electrodes connected respectively to the pair of electrodes** as required.

The Office Action concedes that Sanma fails to teach the thickness of the substrate is between 200 and 1000 μm , has a dielectric constant not higher than 5, the pair of electrodes is at least partially covered by an insulated protective film with a dielectric constant of not higher than 5 and a thickness of 0.4 μm and 1 μm .

The Office Action relies upon Fleischer for teaching an insulating substrate made of a material with a dielectric constant not higher than 5 and a pair of electrodes at least partially covered by an insulated protective film.

Initially, Applicant submits that Fleischer is not directed to an alcohol concentration sensor of an electrostatic capacitance type adapted to measure an alcohol concentration in an internal combustion engine fuel mixed with alcohol and is therefore non-analogous art.

Fleischer is directed to gas sensors, specifically to an apparatus for detecting methane gas in a gas mixture. Fleischer sought to provide a methane gas sensor useful at high temperature and in the presence of commonly used solvent vapors. *Fleischer*, column 1, lines 5-35.

Accordingly, the reference is not remotely related to the present field of invention which is **an alcohol concentration sensor**.

Following the decision by the Supreme Court of the United States in *KSR International v. Teleflex, Inc.*, 127 S.Ct. 1727, 167 L.Ed2d 705, 82 U.S.P.Q.2d 1365 (2007), the analogous art requirement remains an important part of the primary analysis under *Graham v John Deere Co. of Kansas City*, 383 U.S. 1, 86 S.Ct. 684, 15 L.Ed.2d 545, 148 U.S.P.Q. 459 (1966). As recently re-stated by the Board of Patent Appeals and Interferences:

The analogous-art test requires the Board to show that a reference is either in the field of the applicant's endeavor or is reasonably pertinent to the problem with which the inventor was concerned in order to rely on that reference as a basis for rejection.

Ex Parte Bartly et al., 2008 WL 275524 (Bd.Pat.App. & Interf. 2008) (Appeal No. 2007-2583).

The Board has further explained that:

In view of KSR's holding that "any problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the matter claimed" [citation omitted] it is clear that the **second part** of the analogous-art test as stated [above] must be expanded to require a determination of **whether the reference**, even though it may be in a different field from that of the inventor's endeavor, is one which, because of the matter with which it deals, **logically** would have commended itself to an artisan's (not necessarily the inventor's) attention in considering **any need or problem** known in the field of endeavor.

In the present situation, the Fleischer reference is directed to a gas sensor operable at high temperature to detect methane in the presence of solvent vapors. The present invention is directed to a sensor adapted to measure the concentration of alcohol in an internal combustion engine fuel. Accordingly, the field of the reference is greatly different than that of the

applicant's field endeavor. Accordingly, the reference fails the first prong of the analogous art test.

Turning to the second prong, the Applicant is seeking a sensor to measure the alcohol concentration in an internal combustion engine fuel. Quite differently, Fleischer is seeking a sensor to operate at high temperature to detect methane gas in the presence of solvent vapors. Clearly, the reference is not reasonably pertinent to the problem with which the Applicant was concerned. Consequently, the reference fails the second prong of the analogous art test.

Applicants respectfully submit Fleischer is nonanalogous art and cannot be considered pertinent prior art under § 103. Therefore Fleischer cannot be relied upon as a basis for rejection.

Applicant respectfully request withdrawal of Fleischer as a basis for rejection.

Furthermore, Fleischer is not directed to an alcohol concentration sensor of **an electrostatic capacitance type** as the present invention. There is no reasonable motivation for an ordinarily skilled artisan to look to sensors operating on the change in electrical resistivity, conductivity, or relative permeability as in Fleischer (*Fleischer*, Abstract) to solve a problem in an electrostatic capacitance type sensor.

In the event Fleischer can be found to be a relevant reference, and assuming, arguendo, that the teaching of the reference is as asserted in the Office Action, Fleischer fails to correct the deficiencies in Sanma.

For at least the foregoing reasons, it is believed that revised independent claim 8 patentably distinguishes over the relied upon portions of Sanma and Fleischer, either alone or in combination, and is therefore allowable. Further, claims 10 and 15-20, which depend from claim 8, are allowable as well.

Statements appearing above with respect to the disclosures in the cited references represent the present opinions of the Applicants' undersigned attorney and, in the event that the Examiner disagrees with any such opinions, it is respectfully requested that the Examiner specifically indicate those portions of the respective reference providing the basis for a contrary view.

CONCLUSION

In view of the foregoing, it is believed that the present application is in condition for allowance. Accordingly, Applicants' attorneys respectfully request that a timely Notice of Allowance be issued in this case.

Please charge any fees incurred by reason of this response and not paid herewith to Deposit Account No. 50-0320.

Respectfully submitted,
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